APPLICATION OF REMOTE SENSING FOR FISHERY RESOURCE ASSESSMENT AND MONITORING

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Approved: _____
K. J. Savastano
Principal Investigator

Date Submitted: _____

Technical Monitor: KH Faller
NASA/JSC Earth Resources Laboratory
National Space Technology Laboratories
Bay Saint Louis, Mississippi 39520

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INTRODUCTION

This is report #14 of a series of monthly progress reports required by the Statement of Work for Skylab Experiment #240 entitled "Application of Remote Sensing for Oceanic Gamefish Assessment and Monitoring" under Contract No. T-8217B which has been extended to June 30, 1975. The funded extension was approved on October 4, 1974.

OVERALL STATUS

The project is currently in the final stage. Over the next 5-month period analysis of the Skylab imagery in conjunction with the white marlin distribution data will be performed. This report covers the period from June 30, 1974 to January 30, 1975.

RESULTS

a. S192

Initial imagery from the S192 sensor has been received and reviewed. No analyses will be attempted until imagery of data corrected for the conical scan is received. Magnetic tapes containing the corrected digital S192 data have been received and turned over to NASA (ERL) for processing.

b. S191

Examination of the S191 data acquired over our test area during the Skylab/Gamefish Experiment has revealed that cloud cover obscured at least four of the surface truth sampling stations. Please refer to Figure A, the isometric presentation of the visible portion (.4-1.1 μ) of the S191 spectra for the following discussion.

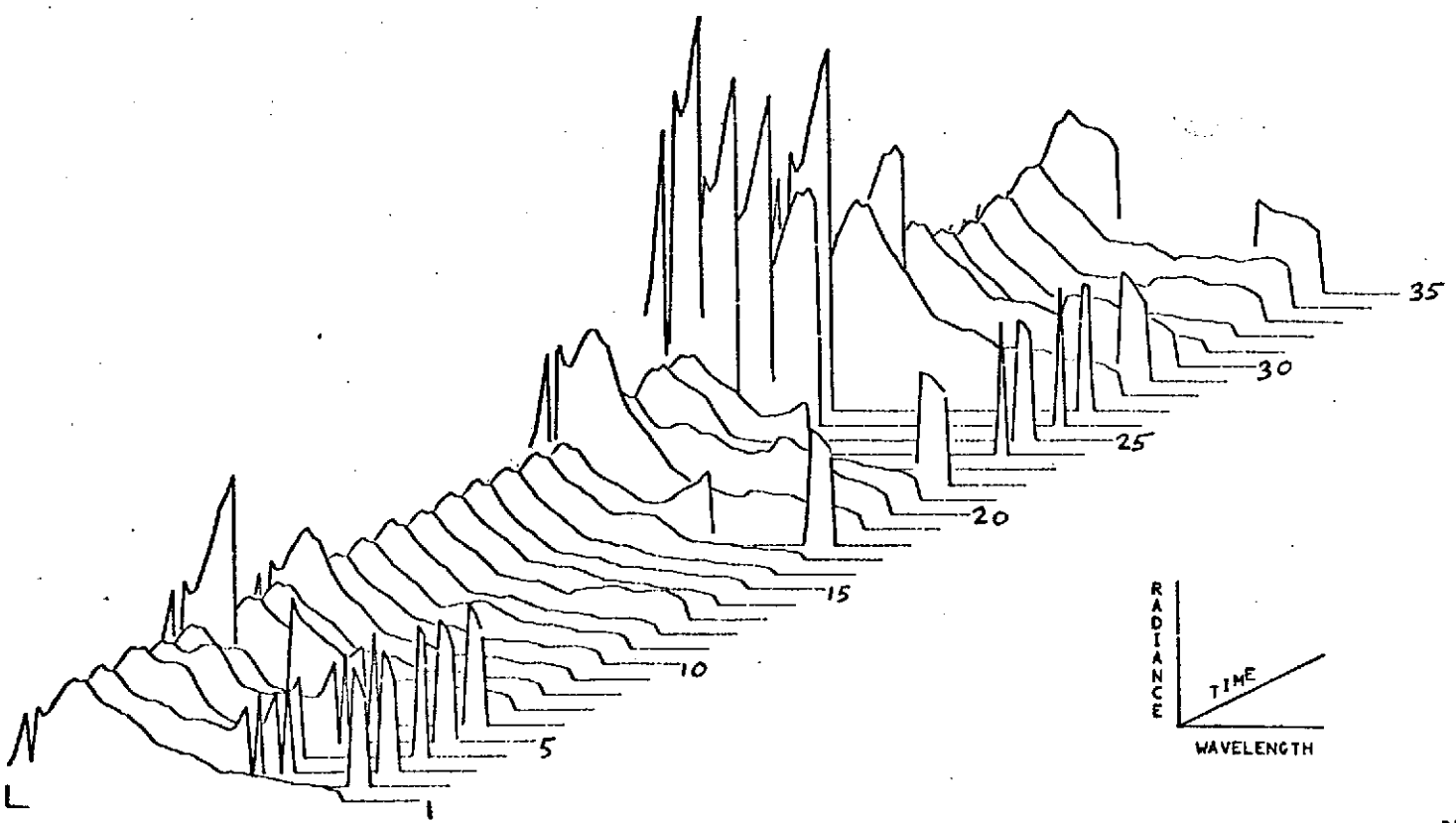

Figure A. The Isometric Presentation of the Visible Portion of the S191 Spectra

Surface sampling stations were located in the areas sampled by the S191 as spectra 13, 15, 18, 20, 22, 25, and 27. Spectra 13 and 15 were cloud free, while spectrum 20 appears to be contaminated. This presentation of the data represents the information from channel A3, the high gain silicon detector. When this channel saturates, a value of zero is indicated, so when the spectrometer was viewing the very bright clouds and the signal was saturated, the spectrum indicates a zero radiance.

Spectra 1 through 6 are saturated in the near IR because of surface vegetation on the land. Spectra 7 through 15 appear free of cloud contamination. Spectrum 18 indicates saturation in one portion of the spectrum, due most likely to a small cloud which entered the sensor field of view only briefly. Spectra 19 through 21 appear contaminated, but not saturated. Spectra 22 through 27 are saturated. The rest of the spectra are all contaminated, 29 and 35 being saturated. Because of the cloud cover problems, further analysis of the S191 will not be pursued.

c. S190B and S190A

The S190B film has been received and frames were cut and matched to encompass the entire gamefish tournament test site. It has been determined that the location of the white marlin catches to the center of 10 mile squares did not provide sufficient spatial resolution to compare the catches to Skylab imagery. To rectify this problem, a search was made to find the location of all white marlin hooked on 5 August, 1973. The captains of the boats were contacted to determine which ones used electronic navigation equipment to determine their location when they hooked a fish. All cases of reasonably accurate position were then plotted as an overlay of the S190A imagery which had been density sliced and false color enhanced. A total of 13 fish were hooked and located accurately. Six of the 13 are in cloud free areas, however two of the six are in areas of sun glint.

A quick look of the S190B imagery demonstrates that the resolution of this sensor is sufficient to allow many of the sport fishing boats to be seen in the imagery.

EXPECTED ACCOMPLISHMENTS

Further analysis of the white marlin catches (exact locations) and the S190B imagery will be performed. A different method of preparing a composite test area from the S190B transparencies will be investigated in order to retain as much of the surface water detail as possible for density slicing and fish catch overlay analysis. It is hoped that the S192 corrected imagery will be more helpful in eliminating the sun glint which has caused problems in the above mentioned analysis. A concentrated effort will be made to process the S192 data to provide reflectivity values for 10-mile and 5-mile squares in the test area for each of the 13 channels. This data will then be used to determine if there is any correlation between the white marlin distribution data and the S192 data and if an empirical model can be developed.